REMARKS

In the subject Office Action, the examiner rejected Claims 1, 3 and 5 under 35 USC 103(a) over Norton '352, and rejected Claims 4 and 6 under 35 USC 103(a) over Norton '352 in view of Wallace '858. Applicants request reconsideration of their application in view of this response, which amends Claim 1 and presents argument in support of the patentability of the pending claims.

Claim 1 recites a method in which the free mass of a vehicle occupant is determined based on a variation of the measured occupant seat weight with respect to a variation of the vertical acceleration of the vehicle, and a weight threshold is adjusted above or below a default value if the determined free mass is respectively below or above an established range of values corresponding to an average weight occupant. When the free mass of an occupant is above the established range, the threshold is adjusted below the default value to increase the likelihood that air bag deployment will be enabled. When the free mass of an occupant is below the established range, the threshold is adjusted above the default value to decrease the likelihood that air bag deployment will be enabled. The current value of the threshold is maintained when the determined free mass is within the predetermined range. As demonstrated below, this method is neither shown nor suggested by Norton.

Applicants agree with the examiner that Norton determines a secondary estimate of occupant weight based on an observed change in the measured weight divided by a concurrent change in vertical acceleration. The secondary estimate is used along with other data such as the measured weight and the seat belt tension to judge the "best available weight estimate", which is compared to a weight threshold such as 95 lbs. to determine if deployment should be allowed or suppressed; see, for example, column 21, lines 43-65. Part of the "best available" weight judgment involves using the secondary weight estimate to distinguish between a normally seated person and a tightly cinched

child seat; see column 16, lines 22-30 and 30-37. Applicants also agree with the examiner that there is no difference in principle between changing a weight estimate by say, 5 lbs., and changing the weight threshold by the same amount. As discussed below, Applicants nevertheless respectfully submit that their method differs in non-obvious ways from the methods disclosed by Norton and/or Wallace, and have amended Claim 1 to emphasize the differences.

Claim 1 as amended herein includes the steps of:

establishing a predetermined range of free mass values corresponding to an average weight occupant;

adjusting said threshold below said default value when the determined value of said free mass is above a the predetermined range of free mass values;

adjusting said threshold above said default value when the determined value of said free mass is below the predetermined range of free mass values;

maintaining a current value of said threshold when the determined value of said free mass is within said predetermined range of free mass values;

In the process of implementing and testing free mass estimation based on $\Delta PS/\Delta ACCEL$ in a motor vehicle, Applicants found that the estimation is subject to variation due to both occupant movement and road surface variations. The resulting variations in free mass estimation are not easily characterized because neither occupant movement nor road surface variations are typically characterized. For this reason, applying the free mass estimation to either the occupant weight or the threshold to which the weight is compared tends to cause oscillation in the occupancy status, which is considered to be undesirable

at least in systems including an occupant status indicator because it is annoying and undermines the driver's confidence in the restraint suppression system. Nevertheless, Applicants found that free mass estimation provides useful and beneficial information to the extent that it falls outside an established range of free mass values corresponding to an average weight occupant. When the free mass estimation is outside the established range, adjustment of the threshold as recited in Claim 1 has the effect of minimizing system variability by increasing the likelihood that STATUS will be set to OCCUPIED ALLOW for an adult (high free mass) occupant, and that STATUS will be set to OCCUPIED INHIBIT for a child (low free mass) occupant; see page 11, lines 1-4. When the free mass estimation is within the established range, maintaining a current value of the threshold as recited in Claim 1 prevents undesired oscillation in the occupancy status due to non-weight-related variation of the free mass estimation. Applicants respectfully submit that these differences are neither shown nor suggested by Norton (or Wallace), and therefore request that the rejection of Claim 1 and dependent Claims 3-6 be withdrawn.

Dependent Claim 3 additionally recites the steps of:

sampling output signal values and computing an average of the sampled values;

identifying sampled output signal values that are within a specified percentage of said average;

computing a first variance of the identified output signal values;

computing a second variance of the measured vertical acceleration; and
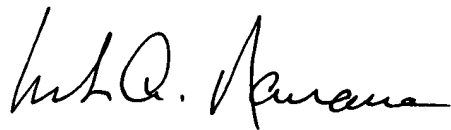
determining the value of free mass according to a ratio of the first variance and the second variance.

Basing the free mass estimation only on weight samples that are within a specified percentage of an average of the sampled values minimizes the effect of occupant movement on the free mass estimation; see page 6, lines 16-19 and page 9, lines 26-31 of Applicants' specification. This limitation is neither shown nor suggested in any combination of Norton and Wallace, and therefore provides an additional reason why the rejection of Claim 3 should be withdrawn. Moreover, Claim 3 recites computing first and second variances, and determining the value of free mass according to a ratio of the first variance and the second variance. Variance is a mathematical term of art, is defined in the specification at page 10, lines 3-19, and involves much more than the simple difference in values taught by Norton. Accordingly, this limitation likewise is neither shown nor suggested by any combination of Norton and Wallace, and therefore provides yet another reason why the rejection of Claim 3 should be withdrawn.

For the reasons stated above, Applicants request that the rejection of Claim 1 and dependent Claims 3-6 be withdrawn. Claims 1 and 3-6 are believed to be in condition for allowance, and such allowance is respectfully requested.

Respectfully submitted,

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